Monostotic Fibrous Dysplasia of the Lumbar Spine

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MONOSTOTIC FIBROUS DYSPLASIA of bone is more common than the literature would indicate[9] and is more common than the more reported polyostotic variety with all of its various clinical manifestations.[5,17] Many lesions would go unnoticed if not for a traumatic event, which may or may not result in a fracture, but does result in persistent localized swelling and tenderness. Generally, the lesions are small and often a biopsy is necessary for definitive diagnosis after radiography has indicated a pathological process is present. We are reporting on a case of monostotic fibrous dysplasia of the lumar spine diagnosed after an industrial accident.

CASE REPORT

In September, 1980 a 23-year-old white male in excellent health was working in a railroad yard and fell down, landing on the railroad track and injuring the lumbar region of his back. At that time, the patient had no neurovascular compromise but did show considerable paraspinal muscle spasm. Roentgenograms at this time were normal. The patient was admitted to the hospital for bedrest and physical therapy for 1 week. All laboratory data were normal. By November, 1980 the patient had shown no improvement and a bone scan and EMG were done.

The bone scan showed multiple foci of increased activity involving the upper lumbar spine, sacroiliac joint, and sternum; at this time, the patient volunteered more information concerning a previously injured sternum in a motor vehicle accident. His EMG was within normal limits. A lumbosacral corset was prescribed which alleviated much of the symptoms.

In February, 1982, while in follow-up the patient had another bone scan which showed resolution in the areas of the sternum and sacroiliac joint, but persistent uptake in the third lumbar vertebral body. Plain roentgenograms had not changed from previous films. The patient continued to have pain in his lumbosacral region from November, 1982 until June, 1984. A TENS unit was tried during this time with mixed results. It was finally discontinued by the patient.

Because of a sudden flareup of severe back pain, a bone scan was obtained in June, 1984. This showed a "hot spot" in the pedicle and body of the third lumbar vertebra. Plain roentgenograms showed an enlarged pedicle with a lesion in the body of the third lumbar vertebra also. A CAT scan showed enlargement of the cortex around the entire periphery without evidence of cortical breakthrough.

In November, 1984 the patient was finally amenable to a biopsy. Needle biopsy reports were consistent with an osteoid osteoma. Because of the lack of correlation between radiographic findings and biopsy report, the patient was referred to the Good Samaritan Hospital for excisional biopsy and stabilization of his spine. Upon admission, plain oblique roentgenograms of his lumbar spine were obtained (Figure 1) as well as tomograms. The tomograms revealed a lytic lesion involving the right body, pedicle, transverse process, and lamina of the third lumbar vertebra, so a CAT scan (Figure 2) was obtained. At this time, an EMG was done which was consistent with a third lumbar radiculopathy.

Physical examination on admission was difficult because of patient agitation. He complained of midlumbar back pain and right thigh pain with parasthesias over anterior thigh. He noted this sensory deficit began after the biopsy. Multiple puncture sites were noted in the lumbar region from his biopsy. The point of maximal tenderness was over these puncture wounds.

He presented with his right hip flexed 30° and resisted attempts at range of motion of the hip. A sensory deficit was noted over the anterior, medial, and lateral sides of his right thigh but below the knee, his examination was intact when compared to the left side. His deep tendon reflexes were brisk and equal bilaterally except for his quadricep function on the right side which was 4/5. The patient had good anal sphincter tone and no increase in radicular symptoms with a valsalva maneuver. No cutaneous lesions were noted. The admission laboratory test data were all within normal limits except for a slightly elevated glucose at 121 and an elevated LDH of 305 (100–225). His sed rate at this time was 20 (0–20).

On December 7, 1984, the patient underwent an exploration of his lumbar spine through a posterior approach. A decompressive laminectomy of the third lumbar vertebra was done with excision of the transverse process and pedicle; a partial excision of the vertebral body was done through this approach and a spinal fusion from the second to the fourth lumbar vertebra was done in conjunction with a Luque rectangle with sublaminar wires from the second to the fourth lumbar vertebrae.

Because of the inaccessibility of the lesion to complete excision through a posterior approach and the fact that a possible residual kyphotic deformity may result, on December 18, 1984 the patient underwent an anterior exploration with complete excision of the third vertebral body and anterior fusion with autogenous fibula with Dunn instrumentation from the second to the fourth vertebral bodies. Postoperative roentgenograms showed good vertebral height (Figure 3).

Histological slides (Figure 4A, B) were sent to the Mayo Clinic where a diagnosis of fibrous dysplasia[18] was made which concurred with the pathological diagnosis at the Good Samaritan Hospital.

The postoperative course of the patient was uneventful. He was ambulatory by the third postoperative day in a thoracolumbar corset to protect the fusion mass. He was discharged from the hospital on December 27, 1984. The patient's parasthesias resolved within a month but he has continued to have pain in the area of the lumbar spine. Currently, the patient is drawing disability and is requiring moderate amounts of pain medications and muscle relaxers. Roentgenograms show a stable spine with incorporation of bone graft.

From the Good Samaritan Hospital, Cincinnati, Ohio.
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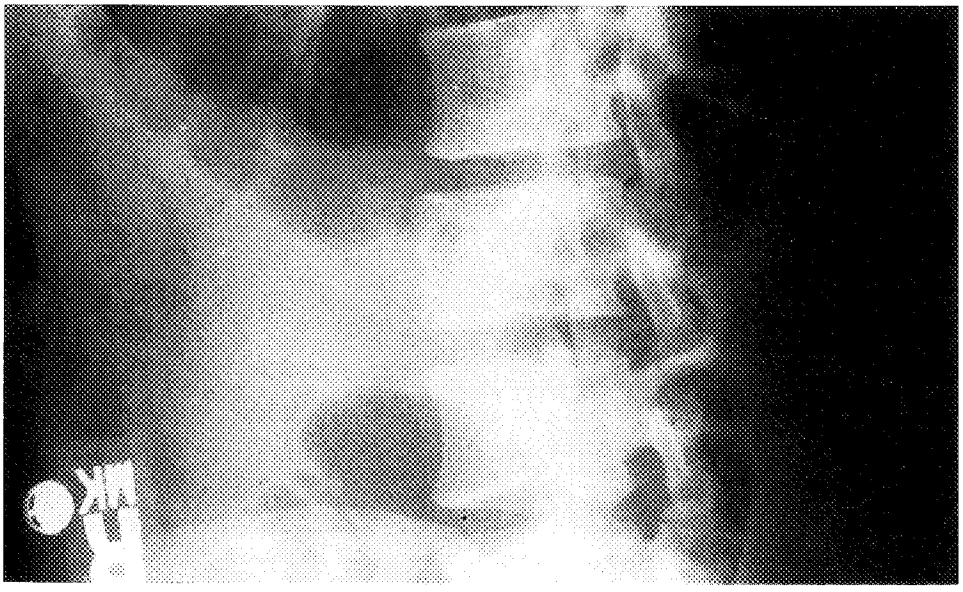

Fig 1. Oblique radiograph of the lumbar spine showing the enlarged pedicle of the third lumbar vertebra.

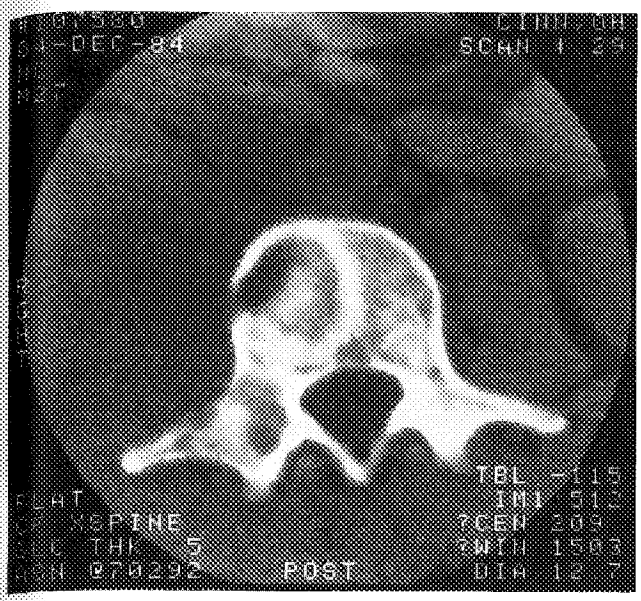

Fig 2. Computerized axial tomogram of the third lumbar vertebra. Note the involvement of the body, pedicle and transverse process. The lesion shows a rarefied zone surrounded by a narrow rim of sclerotic bone. (The cortical breakthrough noted is secondary to biopsy.)

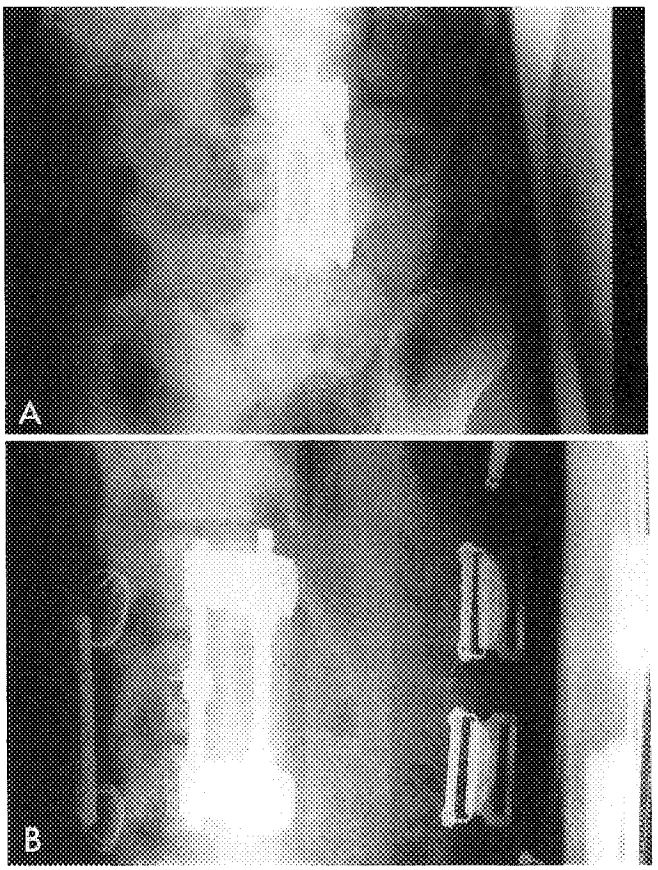

Fig. 3. A, B, Anteroposterior and lateral radiographs after excision of the lesion following a two-staged procedure. Note the Dunn instrumentation anteriorly and Luque rectangle posteriorly.

DISCUSSION

As evidenced by the patient's long and frustrating experience, monostotic fibrous dysplasia of the spine is very rare and protean in its manifestations. It generally is recognized as an incidental finding following trauma to the involved area.[9,14] It is only speculation in this case, but probably the initial traumatic episode had no bearing on the final outcome of the disease.

Fibrous dysplasia is classified as a developmental skeletal disease consisting of a combination of immature fibrous connective tissue and poorly formed immature trabecular bone replacing portions of normal bone[1-3,6,8-10,18] (Figure 4B). The variable presentation of symptoms make diagnosis of both the monostotic and polyostotic forms occasionally difficult as was seen in this case. The polyostotic form is much more frequently reported in the literature[5,6,9,16,17] because it is more severe, particularly when it involves the weight-bearing bones and/or involves the endocrine and integumentary systems.

The literature is sparse on monostotic fibrous dysplasia of the spine. It was first categorized as an entity by Lichtenstein and Jaffe in 1942.[9] There were no cases of single spinal involvement at that time. Schlumberger[14] described 67 cases of monostotitc fibrous dysplasia with only one patient having spinal involvement (cervical). Rosendahl-Jensen[13] and Rosencrantz[12] from Europe described an isolated case each of cervical and thoracic involvement. Harris,[5] in 1962, described a case involving the transverse process of the fourth lumbar vertebral body. Mirra[10] reported a 4% incidence of spinal involvement but case reports were not identified.

Generally, if the lumbar spine is involved, it is usually in the vertebral arch[15] rather than primarily in the vertebral body, which also makes this lesion unique.

The radiographic appearance of this lesion on CAT scan (Figure 2) is very characteristic of fibrous dysplasia.[2,8,10,18] It shows a rarefied zone surrounded by a narrow rim of sclerotic bone. Oblique roentgenograms during this patient's Good Samaritan hospitalization showed the enlarged pedicle very well (Figure 1). The bone scan of this lesion was also very characteristic for fibrous dysplasia[3,4] but not specific for the disease. It is extremely hyperemic so there is a marked uptake of radiopharmaceutical on the delayed image.

The prognosis for monostotic fibrous dysplasia is good. Variability in treatment from benign neglect to surgical excision is dependent upon location and presenting symptoms. In this case, surgical intervention was elected because of presenting symptoms, the unknown certainty of the diagnosis, and the location with respect to structural stability of the spine.

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